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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,423	12/30/2003	David Qiang Meng	10559-914001 / P16854	4620
20985	7590	10/18/2006	EXAMINER	
FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			RUTZ, JARED IAN	
			ART UNIT	PAPER NUMBER
			2187	

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/750,423	<b>Applicant(s)</b> MENG, DAVID QIANG	
	<b>Examiner</b> Jared I. Rutz	<b>Art Unit</b> 2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. Claims 1-26 as amended on 9/26/2006 are pending in the instant application.

Applicant's arguments filed 9/26/2006 have been carefully and fully considered, but they are not persuasive. Accordingly, this Office action is made **FINAL**.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 1-26** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

4. **Claim 1** recites the limitation "*partitioning a memory device to produce a first group of memory entries being accessible in parallel and selectable independent of a second group of memory entries in the memory device that is accessible in parallel*".

The specification does not disclose how a memory device is partitioned to produce the groups recited in claim 1.

5. **Claims 2-7** do not cure the deficiency of claim 1, and are rejected due to their dependence on claim 1.

6. **Claim 8** recites the limitation "*partition a memory device to produce a first group of memory entries being accessible in parallel and selectable independent of a second group of memory entries in the memory device that is accessible in parallel*". The specification does not disclose how a computer program product operates to partition a memory device as claimed.

7. **Claims 9-14** do not cure the deficiency of claim 8, and are rejected due to their dependence on claim 8.

8. **Claim 15** recites the limitation "*a process to partition a memory device to produce a first group of memory entries being accessible in parallel and selectable independent of a second group of memory entries in the memory device that is accessible in parallel*". The specification does not disclose how to make and/or use a content addressable memory manager comprising a process to partition a memory device as claimed.

9. **Claims 16-17** do not cure the deficiency of claim 15, and are rejected due to their dependence on claim 15.

10. **Claim 18** recites the limitation "*a memory device capable of being partitioned to produce a first group of memory entries that is accessible in parallel and selectable independent of a second group of memory entries in the memory device that is accessible in parallel*". The specification does not disclose a memory device capable of being partitioned as claimed.

11. **Claims 19-20** do not cure the deficiency of claim 19, and are rejected due to their dependence on claim 19.

12. **Claim 21** recites the limitation "*And a memory device capable of being partitioned to produce a first group of memory entries that is accessible in parallel and selectable independent of a second group of memory entries in the memory device that is accessible in parallel*". The specification does not disclose a memory device capable of being partitioned as claimed.

13. **Claims 22-23** do not cure the deficiency of claim 21, and are rejected due to their dependence on claim 21.

14. **Claim 24** recites the limitation "*a first group of memory entries being accessible in parallel and selectable independent of a second group of memory entries in the CAM that is accessible in parallel*". The specification does not disclose in such a way to enable one skilled in the art to make or use a content addressable memory as claimed.

15. **Claims 25-26** do not cure the deficiency of claim 24, and are rejected due to their dependence on claim 24.

16. Page 8 lines 7-9 of the specification states "*CAM 54 allows the entries to be accessed in parallel so that all or some of the entries can be checked during the same time period*". This does not teach or suggest the limitations of claims 1, 8, 15, 18, 21, or 24 cited *supra*. This behavior is known to one of ordinary skill in the art. In a CAM, all of the data entries are compared to a data item submitted to the CAM to determine if the CAM holds a matching data item. It is not known to one of ordinary skill in the art how a CAM can be partitioned such that a first group of memory entries is selectable independent of a second group of memory entries. In a typical CAM, all entries are compared to the submitted data item. It is not known to one of ordinary skill in the art

how a CAM can be partitioned such that one group is selectable in parallel independent of a second group, and such partitioning is not disclosed in the specification of the instant application.

17. Page 9 line 18 to page 10 of the specification states:

a. *"Each of the entries in CAM 54 is configurable by a CAM manager 58 that is implemented as microcode in the control store 50 and, which is executed by the packet engine 48. The CAM manager 58 partitions the CAM into a particular number of entries. The CAM manager 58 is capable of partitioning individual entries into two or more subentries that are individually selectable for use in parallel comparisons. By producing subentries, particular ones of the subentries are grouped for storing one type of data (e.g. MAC addresses) and selected for use in comparing the data in parallel. Other subentries in the same CAM entries are grouped for storing and comparing another type of data (e.g., IP addresses). Thus, CAM 54 is configured by CAM manager 58 for storing two or more types of data in subentries that are individually selectable for use in parallel comparisons. By configuring CAM 54 for storing and comparing different types of data, the CAM 54 does not need to be loaded at separate instances with different types of data (e.g. MAC addresses, IP addresses) to perform parallel comparisons with different data types. By reducing the number of instances that CAM entries are loaded, clock cycles are conserved that can be used to execute other operations in packet engine 48 and the network processor 28".*

Art Unit: 2187

18. This section of the specification states, in the first underlined portion, that the CAM manager partitions the CAM, and is capable of partitioning individual entries into subentries. It continues to recite a benefit of producing CAM subentries. In the second underlines portion, the specification states again that the CAM is configured by the CAM manager for storing data in subentries that are individually selectable for use in parallel comparisons. The section finishes by reciting two more benefits of such a configuration for a CAM.

19. This section of the specification, therefore, contains no explanation of how the CAM manager partitions the CAM to enable the entries to be accessible in parallel and selected independently of another group of entries. Accordingly, this section of the specification does not disclose in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention of claims 1-26.

20. Page 10 line 16 to page 11 line 6 states in part "*Referring to FIG. 4, CAM 60 represents CAM 54 configured by CAM manager 58 so that each CAM entry (e.g., entry 0 – entry 15) includes two subentries that store two different types of data*". This section continues to explain what sets of subentries represent in a specific example. Although reciting that the CAM is configured by the CAM manager so that each CAM entry includes two subentries, it provides no explanation of how this is done in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention of claims 1-26.

21. Page 12 lines 5-8 states *"Along with partitioning CAM 60 into sixteen entries that include two sub-entries, CAM manager 58 can configure the CAM to include more or less entries and subentries."* Again, this section of the specification does not explain how the partitioning is performed.

22. Page 12 lines 9-12 states *"Referring to FIG. 5, CAM 70 represents CAM manager 58 partitioning CAM 54 so that each entry includes "n" subentries that are selectable for parallel comparisons with data, for example, retrieved from a received packet."* This paragraph continues with an explanation of what the entries and subentries represent, and concludes on page 13 lines 1-3 with *"the CAM manager is capable of partitioning the individual subentries included in a CAM entry."* There is no disclosure of how the CAM manager is capable of partitioning the subentries of a CAM entry.

23. Page 13 lines 4-7 states *"Referring to FIG. 6, similar to CAM 60 (shown in FIG. 4) and CAM 70 (shown in FIG. 5), CAM 80 represents CAM manager 58 partitioning CAM 54 to include sixteen entries (e.g., entry 0 – entry 15)."* Again, this section does not explain how the CAM manager partitions the CAM, it merely recites that it is done.

24. Page 13 lines 23-24 states *"Referring to FIG. 7, CAM 90 represents CAM manager 58 partitioning CAM 54 so that each entry includes one subentry."* This section does not explain how the CAM manager partitions the CAM, it merely recites that it is done.

25. Page 14 lines 20-23 states *"Referring to FIG. 8, a portion of a CAM manager 110, such as CAM manager 58 stored in control store 50 and executed in the packet*



*engine 48 partitions 112 a CAM into a particular number of entries."* Although this section states that the packet engine partitions a CAM, it does not explain how the packet engine partitions a CAM, i.e. the steps taken to partition the CAM.

26. Page 15 line 20 through page 17 line 7 explain how the CAM stores and performs match detection, but does not explain how the packet engine partitions a CAM, i.e. the steps taken to partition the CAM.

27. Figures 3, 4, 5, 6, and 7 show CAMs having multiple entries, but do not show the entries partitioned into groups. Further, they do not show how a CAM would be partitioned into groups as claimed.

28. Figure 8 shows a flowchart having two steps, partitioning a CAM into entries and partitioning each CAM entry into subentries. Figure 8 does not show a step of partitioning a memory device to produce two groups of entries.

29. Further, page 11 line 19 through page 12 line 1 states *"By allowing CAM 54 to load different data types (e.g., MAC addresses, IP addresses) into each CAM entry and to select which data type to use to determine a potential match, the CAM can be loaded during one time period with two or more different data types compared to loading the CAM multiple times with different data types for separate parallel comparisons in an un-configurable CAM."* Accordingly, the Examiner has reason to believe that in order for one of ordinary skill in the art to make or use the disclosed invention, a special, configurable CAM is necessary. The specification does not enable one of ordinary skill in the art to make or use this configurable CAM, as there is no discussion of how a

configurable CAM differs from an un-configurable CAM, or an explanation of what makes a CAM configurable.

30. **Claims 1-26** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. As presented *supra* with respect to the lack of enablement of claims 1-26, the specification does not provide an explanation of how the claimed invention works. Accordingly, it is not clear to one of ordinary skill in the art that Applicant had possession of the claimed invention at the time of filing.

***Claim Rejections - 35 USC § 101***

31. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

32. **Claims 1-26** are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. As stated in the specification at page 11 line 19 through page 12 line 1, an un-configurable CAM is not capable of performing the claimed functions. As there is no disclosure of a configurable CAM, the disclosed invention is inoperative and therefore lacks utility.

33. **Claims 1-7** are rejected under 35 U.S.C. 101 because the claimed method steps are too preliminary to provide a useful, concrete, and tangible result to one of ordinary

skill in the art. The mere act of partitioning a memory is not sufficient to provide a useful, concrete, and tangible result, and therefore is non-statutory.

***Response to Arguments***

34. Applicant's arguments filed 9/26/2006 have been carefully and fully considered, but are not found persuasive.

35. **First point of Argument**

36. In the fourth paragraph beginning on page 6 and continuing on page 7, with respect to the rejection of claims 1-26 under 35 USC 112 first paragraph for failing to comply with the enablement requirement, Applicant argues:

b. *"According to the applicant's specification:*

*Each of the entries in CAM 54 is configurable by a CAM manager 58 that is implemented as microcode in the control store 50 and, which is executed by the packet engine 48. The CAM manager partitions the CAM 54 into a particular number of entries.*

*Pages 9-17 provide further details and examples of how the CAM is configured by the CAM manager 58. Thus, upon reading the application as originally filed, the application would enable one skilled in the art to make and use the same.*

*The application as originally filed provides clear guidance regarding the partitioning of a content addressable memory. Accordingly, Applicants contend*

*that the rejection under 35 U.S.C § 112, first paragraph is improper and should be removed."*

37. The Examiner respectfully disagrees. The cited section of the specification provides no explanation of what the disclosed CAM manager does to partition the CAM *"to produce a first group of memory entries being accessible in parallel and selectable independent of a second group of memory entries in the memory device that is accessible in parallel"* as recited in claims 1 and 8, *"to partition a memory device to produce a first group of memory entries being accessible in parallel and selectable independent of a second group of memory entries in the memory device that is accessible in parallel"* as recited in claim 15. There is no provided explanation of how the disclosed CAM manager allows *"a memory device capable of being partitioned to produce a first group of memory entries that is accessible in parallel and selectable independent of a second group of memory entries in the memory device that is accessible in parallel"* as recited in claims 18 and 21. There is no provided explanation of how a CAM comprises *"a first group of memory entries being accessible in parallel and selectable independent of a second group of memory entries in the CAM that is accessible in parallel"* as recited in claim 24.

38. The cited section of the specification states that the CAM manager is implemented as microcode. There is no explanation provided for what the microcode does to cause a first group of entries in a CAM to be selectable independently of a second group of entries. The actions performed by the CAM manager to partition a

CAM is considered a critical feature to the functioning of a configurable CAM, as the CAM is partitioned by the CAM manager.

39. The Cache Memory Book (Jim Handy, ©1998) provides an explanation of the operation of a typical CAM. The structure shown in figure 1.7 shows how all entries in the CAM can be compared simultaneously to an input data item. As stated in the caption to figure 1.7, *"In a content addressable memory (CAM), an address presented to the compare address bus is compared simultaneously with the contents of every memory location."* As the device is physically configured to compare all the stored data items to the input data item simultaneously, it would be necessary to control the physical circuit to prevent the second group of entries from being accessed while the first group of entries. The specification, as discussed *supra*, is silent as to how this is performed. As the specification does not teach what is done by the cache manager to allow one group of entries to be accessed in parallel independently of a second group of entries, the specification is not enabling for claims 1-26 as discussed *supra*.

40. **Second point of Argument**

41. In the first paragraph beginning on page 7, with respect to the rejection of claims 1-26 under 35 USC 112 first paragraph for failing to comply with the written description requirement, Applicant argues:

c. *"The Examiner also rejected claims 1-26 under 35 U.S.C § 112, first paragraph as failing to comply with the written description requirement.*

*However, the application as originally filed disclosed an embodiment of a method covered by claims 1-9, an embodiment of a computer program product covered*

*by claims 10-14, an embodiment of a CAM manager covered by claims 15-17, an embodiment of a system covered by claims 18-20, and an embodiment of a packet forwarding device covered by claims 20-26. Therefore, the rejection of claims 1-26 under 35 USC § 112, first paragraph should be withdrawn."*

42. The Examiner respectfully disagrees. As stated in MPEP 2163 (I):

d. *"The written description requirement has several policy objectives. "[T]he essential goal' of the description of the invention requirement is to clearly convey the information that an applicant has invented the subject matter which is claimed." In re Barker, 559 F.2d 588, 592 n.4, 194 USPQ 470, 473 n.4 (CCPA 1977)."*

43. As the specification does not describe how the CAM manager performs the partitioning of the CAM, which is a critical feature to the functioning of the disclosed invention, the specification does not provide evidence that the Applicant had possession of the claimed invention at the time of filing the application.

44. **Third point of Argument**

45. In the second paragraph beginning on page 7, with respect to the rejection of claims 1-26 under 35 USC 101 for lack of utility, Applicant argues:

e. *"The Examiner also rejected claims 1-26 under 35 USC § 101 for lack of utility. The Examiner stated:*

i. *As stated in the specification at page 11 line 19 through page 12, line 1, an unconfigurable CAM is not capable of performing the claimed*

*functions. As there is no disclosure of a configurable CAM, the disclosed invention is inoperative and therefore lacks utility.*

f. *The applicant disagrees, the portion of the specification to which the examiner refers states:*

ii. *By allowing CAM 54 to load different data types (e.g., MAC addresses, IP addresses) into each CAM entry and to select which data type to use to determine a potential match, the CAM can be loaded during one time period with two or more different data types compared to loading the CAM multiple times with different data types for separate parallel comparisons in an un-configurable CAM.*

g. *The portion of the specification to which the examiner refers describes the advantage of partitioning the memory of a configurable CAM in comparison to using an un-configurable CAM."*

46. The Examiner respectfully agrees with Applicant's conclusion. A configurable CAM can be partitioned, and an unconfigurable CAM cannot be partitioned. However, as Applicant has not disclosed a configurable CAM, or how a configurable CAM differs from an unconfigurable CAM, Applicant has not disclosed an operative invention. As Applicant has not disclosed an operative invention, the invention claimed by Applicant is inoperative for the reasons presented *supra*, and therefore lacks utility.

47. In the third paragraph beginning on page 7 and continuing on page 8, Applicant continues:

h. *"In addition, applicant again refers the Examiner to the above quoted paragraph describing that the CAM is configured by a CAM manager 58 that is implemented as microcode in the control store. Accordingly there is a disclosure of a configurable CAM and applicant's specification discloses a utility and therefore, the rejection of claims 1-26 under 35 USC § 101 should be withdrawn."*

48. The Examiner respectfully disagrees. For the reasons presented *supra*, the cited section stating that the CAM manager is implemented as microcode is not sufficient to explain how the claimed invention works.

### **Conclusion**

49. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

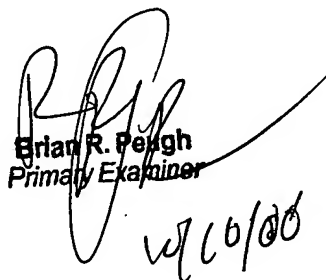
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jared I. Rutz whose telephone number is (571) 272-5535. The examiner can normally be reached on M-F 8:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
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